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Oral Rehabilitation of 5 Years-Old Patient with Amelogenesis Imperfecta: A Case Report

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Abstract

Introduction: Amelogenesis imperfecta is a complicated group of developmental disorders that affect both primary and permanent dentition in an equal, less or more manner. AI considers as a serious problem that reduces the quality of life and causes some physiological problems. Oral rehabilitation for patients with AI will extend for a long-term to achieve regular restorative treatment for both dentition and to maintain a high level of oral health. We presented here AI case, which was early diagnosed and was followed up for 3 years.

Case report: A 5-years-old male patient presented to the Department of pedodontics and orthodontics, Damascus University, with the chief complaint of non-normal, rough, yellow and pigmented teeth. These features were exited in both primary and permanent dentition. A comprehensive treatment plan was done to provide functional and aesthetic demands. Caries removal, composite restoration and SSCs were done for the primary and permanent molars. Composite veneers for primary canine were also done. Posterior bite plane with a tongue crib was used to manage the anterior skeletal open bite.

Conclusion: Diagnosis AI as early as possible will offer a rapid intervention to restore affected teeth thereby reducing dental wearing and sensitivity.

Keywords: Amelogenesis Imperficta (AI); Molar Incisor Hypomineralization (MIH); Stainless steel crowns (SSCs)

Introduction

Amelogenesis imperfecta is a complicated group of an inherited, congenital disorders that affects tooth enamel development, and clinically assumes as a quantitative and qualitative changes in enamel structure for both primary and permanent dentition [1]. AI usually not related to any syndromes, diseases or genetic disorders [2], and can be inherited in an autosomal recessive, autosomal dominant or x- Linked [3].

The genes that provide instructions for making proteins that are essential for normal tooth development are enamelin, ameloblastin, tuftelin, MMP-20 and kallikrein, hence the mutations in these genes can cause AI [4]. The exact prevalence of AI is unknown, but it seems to be very widely, it's estimated to be 1 in 700 people in northern Sweden to 1 in 14,000 people in the United States [5,6]. The autosomal dominant AI is the most prevalent in United States and Europe, however the autosomal recessive AI in the Middle East was the most [6-7].

The clinical manifestation of AI include smaller, sensetive teeth with yellow or brown discoloration, rapid attrition, excessive calculus deposition, gingival hyperplasia and bite malocclusion, The exact characteristics of the enamel defect depend on the types of AI which involved hypoplastic, hypocalcified and hypomaturation as shown in (Table 1) [8].

Table 1: *The types of amelogenesis imperfecta.*

Hypoplastic	Hypocalcified	Hypomaturation
• Autosomal dominant hypoplastic-hypomaturation with taurodontism. • Autosomal dominant smooth hypoplastic with eruption defect and resorption of teeth. • Autosomal dominant rough hypoplastic. • Autosomal dominant pitted hypoplastic. • Autosomal dominant local hypoplastic. • X-linked dominant rough hypoplastic	• Autosomal dominant hypocalcified.	• X-linked recessive hypomaturation. • Autosomal recessive pigmented hypomaturation. • Snow-capped teeth, autosomal dominant. • White hypomature spots.

The final and specific diagnosis of the AI types depends on histological and genetic examination, rather than scanning electron microscope would be the most effective diagnostic method [9]. Differential diagnosis involved dental fluorosis, which can distinguished from AI by patient's questioning about any excessive fluoride intake, eating toothpaste or water supply in childhood. Fluorosis represented clinically as a horizontal white banding on the developmental synchronization teeth [10]. Molar incisor hypomineralization (MIH) may be also considered as above [10].

Case Report

A 5-years-old male patient presented to the Department of pedodontics, Damascus University, with the chief complaint of rough, yellow, discolored teeth that did not remove by tooth brushing and sensitivity to cold. These features were exited since first primary teeth were erupted according to parents questioning. The patient did not have any previous or current genetic disease; however, his cousin suffered from the same problem according to medical and family history. The dental history shows that it was the first patient's visit to the dental clinic since birth. After the first visit the patient was evaluated as definitely positive, interested in the dental procedures, according to FRANKL behavioral rating scale. Clinical examination shows primary and permanent teeth with structural loss, discoloration, and caries on 54, 55, 64, 65, 74, 75, 84, 85, 16, 26, 36, and 46. Moreover, anterior skeletal open bite was recorded (Figure 1-3). Panoramic radiography shows a thin enamel layer and totally existence of permanent teeth (Figure 4).

A comprehensive treatment plan was done to provide functional, esthetic and emotional demands. The treatment divided into two sessions, at the first session the pedodontist restore the first and second primary molars with composite restoration (Z250TM 3MESPE, USA) and stainless steel crowns (SSCs) (3MTMESPETM, USA) after caries excavation with or without Pulpotomy. Caries removal, composite restoration (Z250TM 3MESPE, USA) and SSCs (3MTMESPETM, USA) were also done for the first permanent molars. Composite veneers (Z250TM 3MESPE, USA) for primary canine were done. All composite restorations were done under rubber dam (Figure 5). Patient's follow-ups were done every six months to estimate oral hygiene and to apply fluoride varnish (3MTMVarnishTM5% sodium fluoride) (Figures 6,7).

Figure 1: *Skeletal open bite.*

Figure 2: *Occlusal view of the maxillary jaw.*

Figure 3: *Occlusal view of the maxillary jaw.*

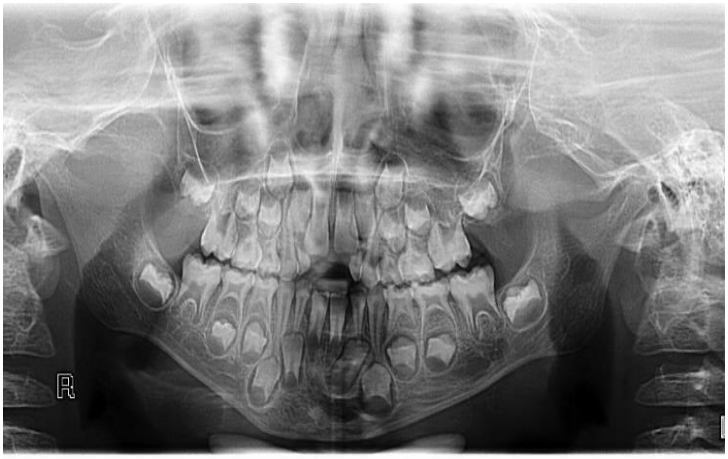

Figure 4: *Panoramic radiography at the begining of the treatment.*

Figure 5: *The first session of restorative treatment.*

Figure 6: *Follow up after one year: the eruption of the anterior upper and lower permanent teeth.*

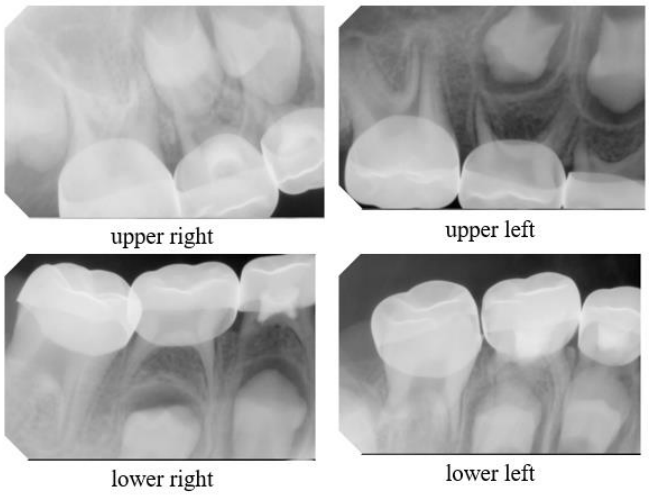

Figure 7: *Apical radiography after one year follow-up.*

After upper and lower permanent incisors eruption (Figure 6), the patient referred to the department of orthodontics - Damascus University to manage the anterior skeletal open bite. Posterior bite plane with a tongue crib were chosen to correct this case. The device was used all over the time except of food time, and school hours to avoid bulling from classmates. Recall appointments for orthodontic status were done every four weeks.

After three years of follow- up appointments, clinical and radiographic examination shows that upper/lower premolars were erupted, skeletal open bite were improved and the SSC for upper left molar needs to replace (Figures 8,9). Finally, Pits and fissures sealant (Clinpro™ 3M ESPE, USA) were applied to all premolars after hypochlorite application.

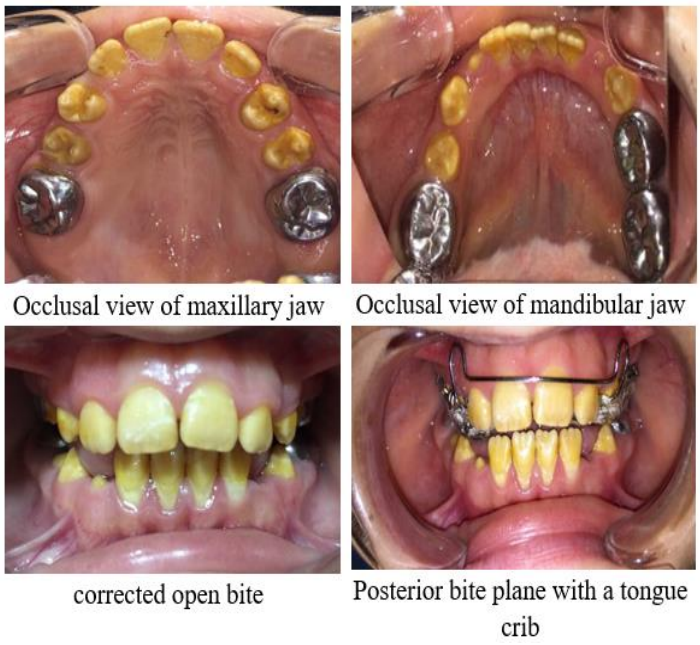

Figure 8: *Follow-up after three years.*

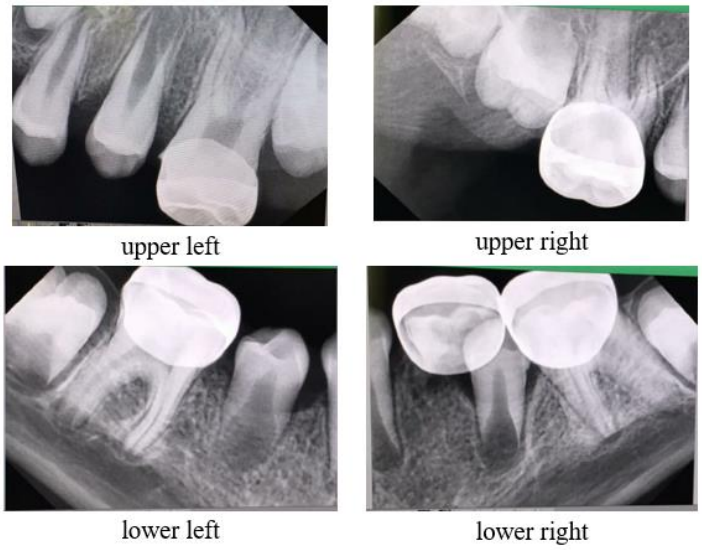

Figure 9: *Apical radiography after three years follow-up.*

Discussion

Treatment plan for children with AI considered as a challenge, it depends on many factors such as age, patient's cooperation, esthetic demands, socioeconomic status, intraoral situation and the onset of the treatment [11,12]. The treatment will extend for a long-term to achieve regular restorative treatment for both dentition and to maintain a high level of oral hygiene [13].

Oral rehabilitation of children with mixed dentition and skeletal open bite is more complex hence; the treatment will be through the period of growth and the restorative treatment for both primary and permanent dentition is necessary to assure the maintenance of masticatory, pronunciation, esthetic and emotional function. In this case, SSCs were done for primary and first permanent molars. SSCs consider a non-invasive, durable, reliable, rapid and economical choice that provide a full crown coverage [14].

Direct composite veneers for primary canines were necessary to protect the remaining tooth structure against further wear, to reduce sensitivity, to cover the discoloration and to improve the esthetic appearance. Preventive aspects, that include topical fluoride, dietary and oral hygiene instruction was done every six months [15]. The posterior bite plane was chosen to allow additional eruption for anterior teeth and to enhance the relative intrusion of the posterior teeth, which led to correct the anterior open bite [16]. Moreover, tongue crib prevents it from pushing directly against the palatal surfaces of the upper anterior teeth, thereby eliminating the undesired pressure contributing to the open bite [17]. At the last recall appointment, pits and fissures sealant were applied to prevent enamel demineralization, however to have a maximum sealant retention we applied hypochlorite for 60 seconds prior to acid etching to ensure enamel surface deproteinisation [18].

Conclusion

Diagnosis AI as early as possible will offer a rapid intervention to restore affected teeth thereby reducing dental wearing and sensitivity. Dental practitioners should take the esthetics demands and social implication in consideration when treat patients with AI.

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